

## NTN Sample Change-out, N-CON Bucket Collector

### Items needed:

Field Observer Report Form (FORF), as started the previous week  
FORF, for next week's sample  
power switch key, if used  
new bucket in protective plastic bag  
new lid in protective plastic bag  
fresh (< 6 months old) deionized or distilled water in a plastic squeeze bottle  
paper towels or lab wipes (e.g., Kimwipes\*)  
plastic washers (16), to adjust height of NTN bucket  
sensor switch (for troubleshooting, if needed, see N-CON sensor change-out SOP)  
carrier (if used) for supplies, lid, and new bucket  
log book, if used



New bucket and lid in carrier



N-CON NTN bucket collector

### Precautions:

Use care when handling the sample bucket and lid to avoid contaminating the sample. NTN samples are analyzed for sodium, chloride, and potassium all of which are present in sweat.


NTN has buckets of different height (see figure on next page). By default, the N-CON collector is configured for the tall bucket. When a short bucket is used, plastic washers must be placed on each of the four bucket posts to raise the height of the bucket. Use the appropriate number of washers to ensure a good seal between the lid pad and the bucket. In general, start with 3 washers, close the collector and check the seal between the bucket and the collector lid. Add/remove washers to each post as needed. Remember to handle the sample bucket with a gloved (or bagged) hand when adjusting the number of washers.

\* **Disclaimer:** The use of trade or manufacturer's name does not constitute an endorsement by the NADP, its sponsors, the University of Illinois or the Illinois State Water Survey.



**Instructions:**

1. Approach the collector from the downwind side (i.e., facing the wind). This will reduce the chance that the sample is contaminated inadvertently. If there is snow or ice on the collector lid, brush it off before proceeding.
2. Make observations as to the conditions of the collection site and equipment. Record observations in Block 10 (**Remarks**) on the Field Observer Report Form (FORF). See the Appendix to this document for a sample FORF.

<b>10. REMARKS</b> <i>For example: equipment malfunction, contamination, farming, burning, logging, leakage before weighing, etc.</i>


**Retrieving the deployed sample bucket.**

3. Locate the ON/OFF switch on the underside of the collector housing. The switch may be a toggle switch, or require a key.

4. Activate the collector lid by waving your hand through the sensor until the lid starts to open. When the lid is open halfway, turn off power to the collector.



5. Inspect the contents of the bucket for contaminants. Do not lean over the open bucket. Doing so may lead to contamination of the sample (e.g., human hair, clothing fibers). Note any contaminants in Block 5 (**Sample Conditions**) of the FORF.

<b>5. SAMPLE CONDITION</b> Check type of contamination for all field buckets before and after decanting. Describe <b>all</b> contamination in Block 10, including any not listed here.	<table border="1"> <tr><th>YES</th><th>NO</th></tr> <tr><td>2</td><td>1</td></tr> <tr><td>2</td><td>1</td></tr> </table>	YES	NO	2	1	2	1	1. Bird droppings	<table border="1"> <tr><th>YES</th><th>NO</th></tr> <tr><td>2</td><td>1</td></tr> <tr><td>2</td><td>1</td></tr> </table>	YES	NO	2	1	2	1	3. Soot/ash/dirt particles	<table border="1"> <tr><th>YES</th><th>NO</th></tr> <tr><td>2</td><td>1</td></tr> <tr><td>2</td><td>1</td></tr> </table>	YES	NO	2	1	2	1	5. Leaves/twigs/pollen/plant matter
	YES	NO																						
	2	1																						
2	1																							
YES	NO																							
2	1																							
2	1																							
YES	NO																							
2	1																							
2	1																							
<table border="1"> <tr><th>YES</th><th>NO</th></tr> <tr><td>2</td><td>1</td></tr> <tr><td>2</td><td>1</td></tr> </table>	YES	NO	2	1	2	1	2. Cloudy or discolored	<table border="1"> <tr><th>YES</th><th>NO</th></tr> <tr><td>2</td><td>1</td></tr> <tr><td>2</td><td>1</td></tr> </table>	YES	NO	2	1	2	1	4. Insects/animal matter	<table border="1"> <tr><th>YES</th><th>NO</th></tr> <tr><td>2</td><td>1</td></tr> <tr><td>2</td><td>1</td></tr> </table>	YES	NO	2	1	2	1	6. Handling contamination	
YES	NO																							
2	1																							
2	1																							
YES	NO																							
2	1																							
2	1																							
YES	NO																							
2	1																							
2	1																							
After decanting into sample bottle, look closely at sample and field bucket and double-check your entry.																								

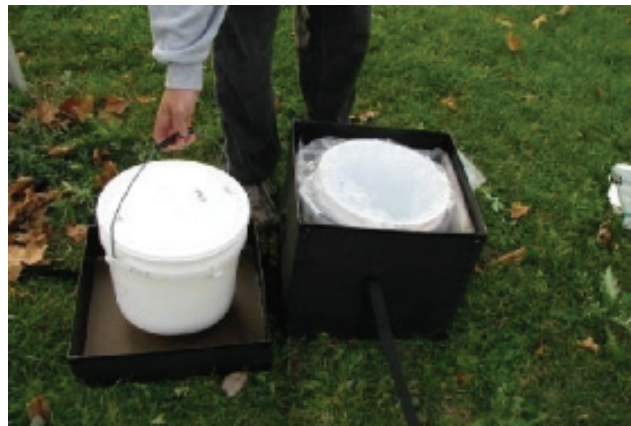
6. Grasp the bagged lid from the side opposite the zip. Fold the bag back over your wrist, exposing the lid with the seal side down. Use the bag as a “glove” and place the lid on the bucket.



- Using your bagged hand, push the leading edge of the lid down firmly on the bucket rim. Avoid touching the lip of the bucket and the underside of the lid with bare hands. Doing so may lead to sample contamination when the sample is decanted.



- Lift the sealed bucket from the collector holder and place it in the carrier or on a clean surface. **Do not set the bucket on bare ground as dirt and dust are difficult to remove when the bucket is washed.** Verify that the lid is sealed firmly on the bucket.



- Complete Block 3 (**Field Bucket**) of the FORF for the previous week to include the OFF Date and Time for the sample bucket that was collected. The Date is expressed in the form MMDDYY. Time is expressed based on a 24-hr clock.

3. FIELD BUCKET						
		Date			Time	
		MO	DAY	YR	0001-2400	
ON						
OFF						

**Cleaning the collector.**

The previous week’s bucket should be removed, sealed, and secured. The new bucket should be bagged and protected prior to deployment.

10. Moisten a lab wipe (e.g. Kimwipes) or paper towels (non-print/colored) with deionized (or distilled) water. Wipe down the:
  - underside of the lid seal pad,
  - top and sides of the collector lid,
  - lid arms,
  - bucket holder posts,
  - splash shield, and
  - clean any debris or spider webs from the sensor.
  
11. Note the condition of the lid seal pad and record any problems in Block 10 (**Remarks**). If the seal pad is torn, punctured or looks discolored, call the CAL for a replacement and circle *lid seal pad* in Block 9 (**Supplies**) of the FORF. A damaged lid seal or one that fits poorly can lead to sample contamination.

<b>9. SUPPLIES</b> <i>Request early.</i>	
<i>Circle if needed, until received.</i>	
CAL address labels	lid seal pad
dashpot fluid	packing tape
dry sample env.	raingage charts
field forms	raingage ink
gloves (S, M, L)	

12. Verify correct operation of the equipment (motorbox, sensor, and raingage). Complete Block 4 (**Site Operations**) of the FORF.

<b>4. SITE OPERATIONS</b> <i>Check YES, NO, or U (Unable to determine) for each field bucket. If <b>NO</b> or <b>U</b> for Item 1 or 2, describe in Block 10 and <b>call CAL</b>.</i>														
<table border="1" style="border-collapse: collapse;"> <tr> <th style="padding: 2px;">YES</th> <th style="padding: 2px;">NO</th> <th style="padding: 2px;">U</th> </tr> <tr> <td style="text-align: center; padding: 2px;">2</td> <td style="text-align: center; padding: 2px;">1</td> <td style="text-align: center; padding: 2px;">0</td> </tr> <tr> <td style="text-align: center; padding: 2px;">2</td> <td style="text-align: center; padding: 2px;">1</td> <td style="text-align: center; padding: 2px;">0</td> </tr> <tr> <td style="text-align: center; padding: 2px;">2</td> <td style="text-align: center; padding: 2px;">1</td> <td style="text-align: center; padding: 2px;">0</td> </tr> </table>	YES	NO	U	2	1	0	2	1	0	2	1	0	<ol style="list-style-type: none"> <li>1. The <b>collector sensor heater</b> and <b>motor box</b> operated properly. Lid is in correct position</li> <li>2. Raingage operated properly during the week.</li> <li>3. Collector opened and closed at least once during the week, <b>other than for testing.</b></li> </ol>	
YES	NO	U												
2	1	0												
2	1	0												
2	1	0												
<table border="1" style="border-collapse: collapse;"> <tr> <th style="padding: 2px;">YES</th> <th style="padding: 2px;">NO</th> </tr> <tr> <td style="text-align: center; padding: 2px;"> </td> <td style="text-align: center; padding: 2px;"> </td> </tr> </table>	YES	NO			<ol style="list-style-type: none"> <li>4. Raingage in winterized state during sampling period (antifreeze in bucket &amp; funnel out).</li> </ol>									
YES	NO													

**Deploying new sample bucket.**

13. Determine whether the bucket to be deployed is “tall” or “short.” Add, or remove plastic washers from the bucket holder posts as described above.

14. Switch to the FORF for the current week's sample. Complete blocks 1 and 2 (**Site** and **Observer**, respectively) for the sample bucket to be deployed. This includes:

- the name of the Site
- the 4 character ID of the Site (e.g., IL11)
- your name as the Observer, and
- your initials

<b>1. SITE</b> Name _____ ID <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<b>2. OBSERVER</b> Print name _____ Initials <input type="text"/> <input type="text"/>
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15. Grasp the new clean bucket by its handle and remove the twist-tie that holds the bag closed. Pull the bag back over your arm so that the bag acts as a “glove”. Turn the bucket upside down and shake it to ensure that no rinse water remains in the bucket. Place the bucket on the collector so its handle is located toward the front of the collector (as illustrated below). The N-CON Systems identification plate is on the front of the collector. Ensure the bucket is firmly seated between the bucket holder posts.



16. Using the switch on the bottom of the collector, turn the collector ON. The collector lid will close. The collector lid should move smoothly. Verify that the lid seal fits snugly over the bucket. If there is a gap between the bucket and the lid seal, it may be necessary to either:

- a. place plastic washers on the bucket holder posts, beneath the sample bucket, or
- b. adjust the collector lid arms

See the SOP titled *Adjusting Collector Lid, N-CON Collector* for details on adjusting the collector arms. Be certain to protect the exposed sample bucket to avoid contamination when cycling or servicing the collector.

If present, remove the power switch key and store for the next site visit.

17. Enter the Date and Time that the sample bucket was placed “ON” the collector in Block 3 (**Field Bucket**) of the FORF for the current week.

		Date			Time			
		MO	DAY	YR	0001-2400			
<b>ON</b>								
<b>OFF</b>								

18. Place the sealed bucket containing last week’s sample in the plastic bag that the new bucket came in. Seal the bag, and return it to the carrier for transport to the field laboratory.
19. Verify that the power switch is in the ON position before leaving the site.

**Incorporating data from raingage.**

20. Complete Block 7 (**Precipitation Record**) of the previous week’s FORF to include the daily precipitation values, and the type of precipitation (i.e., rain, snow, mixed, unknown) for each data with precipitation. Refer to the appropriate SOP for interpreting a Belfort raingage chart, or for downloading data from the electronic raingage.

7. PRECIPITATION RECORD		<i>All sites must circle <b>Precipitation Type</b></i>							
		← <b>Bucket On</b> R – Rain Only (Includes Hail) S – Snow Only M – Mixture U – Unknown <b>Bucket Off</b> →							
		TUES	WED	THURS	FRI	SAT	SUN	MON	TUES
Type <i>circle one</i> →		R S M U	R S M U	R S M U	R S M U	R S M U	R S M U	R S M U	R S M U
Amount Inches or <i>circle one</i> →									
		Z T MM	Z T MM	Z T MM	Z T MM	Z T MM	Z T MM	Z T MM	Z T MM
		Z – Zero		T – Trace (Circle <b>Type</b> )		MM – Missing			
Sample Weight (grams)		X 0.00058 inches/gram =				← Do these values agree within ±5%? →			
		Sample Depth (inches)		YES <input type="checkbox"/>	NO <input type="checkbox"/>	(if no, reweigh)		Total Raingage Depth (inches)	
<i>E-gage sites: Please submit your electronic raingage data promptly after shipping this sample.</i>									

21. Take the bagged and sealed bucket containing last week’s sample to the field lab for processing. This includes weighing the bucket and sample. The sample is then decanted to a bottle for shipment to the CAL for analysis. Refer to the SOP titled *Decanting the Sample for Shipment to the CAL*. Block 6 (**Bucket Sample Weight**) and Block 8 (**Sample Bottle Use**) of the FORF will be completed.

<b>6. BUCKET SAMPLE WEIGHT</b>	
<i>Weigh <b>ALL</b> sample buckets.</i>	
<input type="text"/>	<input type="checkbox"/> Bucket + Lid + Sample
- <input type="text"/>	<input type="checkbox"/> CAL Bucket
- <input type="text"/>	<input type="checkbox"/> CAL Lid
<hr/>	
= <input type="text"/>	<input type="checkbox"/> →
Sample Weight (grams)	

<b>8. SAMPLE BOTTLE USE</b>
<i>Pour <b>ANY</b> and <b>ALL</b> liquid up to 1-liter into the sample bottle.</i>
Did you pour sample into the bottle?
YES <input type="checkbox"/> NO <input type="checkbox"/>

22. Indicate any supplies that are needed in Block 9 (Supplies) of the FORF.


### Contact Information

Please contact the NTN site liaison at 800-952-7353 or via email at [ntn@isws.illinois.edu](mailto:ntn@isws.illinois.edu) if you have any questions, or if any problems are encountered. The site liaison can:

- help troubleshoot equipment problems,
- order replacement parts,
- explain the FORF, and
- explain the steps in this manual in greater detail.



## **Appendix – Sample Field Observer Report Form (FORF)**



**NADP**

**NATIONAL TRENDS NETWORK  
FIELD OBSERVER REPORT FORM (FORF)**

*Send Completed Form with Each Sample to:  
Central Analytical Laboratory, 2204 Griffith Drive, Dock B, Champaign, IL 61820*

**Problems? Call the CAL at 1-800-952-7353  
e-mail: ntn@isws.illinois.edu or fax: 217-333-0249**

FOR OFFICE USE ONLY

NO BOTTLE  BAG  LEAK  SP

Place barcode sticker here

**1. SITE**

Name \_\_\_\_\_ ID

**2. OBSERVER**

Print name \_\_\_\_\_ Initials

**3. FIELD BUCKET**

Date 

MO	DAY	YR

 Time 

0001-2400	

ON 

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OFF 

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**4. SITE OPERATIONS** *Check YES, NO, or U (Unable to determine) for each field bucket. If NO or U for Item 1 or 2, describe in Block 10 and call CAL.*

YES	NO	U
2	1	0
2	1	0
2	1	0

- The collector sensor heater and motor box operated properly.  
Lid is in correct position.
- Raingage operated properly during the week.
- Collector opened and closed at least once during the week, **other than for testing.**
- Raingage in winterized state during sampling period (antifreeze in bucket & funnel out).

**5. SAMPLE CONDITION**

*Check type of contamination for all field buckets before and after decanting. Describe all contamination in Block 10, including any not listed here.*

YES	NO
2	1
2	1

- Bird droppings
- Cloudy or discolored

YES	NO
2	1
2	1

- Soot/ash/dirt particles
- Insects/animal matter

YES	NO
2	1
2	1

- Leaves/twigs/pollen/plant matter
- Handling contamination

*After decanting into sample bottle, look closely at sample and field bucket and double-check your entry.*

**6. BUCKET SAMPLE WEIGHT**

*Weigh ALL sample buckets.*

Bucket + Lid + Sample

CAL Bucket

CAL LB

=  Sample Weight (grams)

**7. PRECIPITATION RECORD** *All sites must circle Precipitation Type*

← Bucket On R – Rain Only (Includes Hail) S – Snow Only M – Mixture U – Unknown Bucket Off →

	TUES			WED			THURS			FRI			SAT			SUN			MON			TUES					
Type	R	S	U	R	S	U	R	S	U	R	S	U	R	S	U	R	S	U	R	S	U	R	S	U			
Amount	----- -----																										
Inches or	----- -----																										
circle one	Z	T	MM	Z	T	MM	Z	T	MM	Z	T	MM	Z	T	MM	Z	T	MM	Z	T	MM	Z	T	MM	Z	T	MM

Z – Zero T – Trace (Circle Type) MM – Missing

Sample Weight (grams) X 0.00058 inches/gram =  Sample Depth (inches)

Do these values agree within ±5%? YES  NO  (If no, reweigh) Total Raingage Depth (inches)

*E-gage sites: Please submit your electronic raingage data promptly after shipping this sample.*

**8. SAMPLE BOTTLE USE**

*Pour ANY and ALL liquid up to 1-liter into the sample bottle.*

Did you pour sample into the bottle?


YES  NO

CAL USE RGSRC

**9. SUPPLIES** *Request early. Circle if needed, until received.*

CAL address labels lid seal pad  
dashpot fluid packing tape  
dry sample env. raingage charts  
field forms raingage ink  
gloves (S, M, L)

**10. REMARKS** *For example: equipment malfunction, contamination, farming, burning, logging, leakage before weighing, etc.*



White copy – Analytical Lab

Pink Copy – Site Operator

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